

DRAFT Technical Information for Water Transfers in 2010

**Information to Parties Interested In Making Water Available
for 2010 Water Transfers**

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Section 1 General Information for Water Transfers in 2010

The California Department of Water Resources (DWR) and Bureau of Reclamation, Mid-Pacific Region (Reclamation), referred to collectively as Project Agencies, prepared this technical information to help conduct water transfers in 2010. This technical information is applicable to all 2010 transfers involving State and Federal contractors and Project facilities. This technical information does not have a regulatory effect, but if followed, will enable the Project Agencies to approve transfers more quickly, where such approval is required (See Appendix A).

The Project Agencies' approval criteria were developed consistent with provisions of the California Water Code and Central Valley Project Improvement Act (CVPIA) that protect against injury to third parties as a result of water transfers. Three fundamental principles include (1) no injury to other legal users of water; (2) no unreasonable effects on fish, wildlife or other in-stream beneficial uses of water; and (3) no unreasonable effects on the overall economy or the environment in the counties from which the water is transferred. The Project Agencies will not approve any water transfer for which these basic principles have not been adequately addressed.

Sellers and buyers should be aware of the uncertainty and risk associated with water transfers. The Project Agencies cannot guarantee that a particular transfer will be successful even with adequate planning, regulatory approval, and monitoring due to the uncertainties related to California's hydrologic conditions and regulatory restrictions on the State Water Project (SWP) and Central Valley Project (CVP) operations. This water transfer information is intended to support implementation of water transfers, while protecting the rights of all legal users of water across California, the environment, and the economy.

Table 1-1 identifies transfers that Reclamation and DWR will or will not consider for approval in 2010.

Table 1-1. Transfers Considered for 2010

Transfers Considered for Approval in 2010	Transfers Not Considered in 2010
Stored water - Release of stored water that would remain in storage in the absence of the water transfer. Storage reduction caused by a transfer must be refilled at a time when downstream users would not have otherwise captured the water.	Direct Pumping of Groundwater - The Project Agencies will not approve the direct transfer of groundwater from one area to another. Water Code Section 1220 establishes significant barriers to the export of groundwater outside the Sacramento Delta-Central Sierra Basins.
Cropland Idling/Crop Shifting - Reduction in surface water use resulting from reduced ETAW of agricultural crops that would have been planted in the absence of the water transfer (see Section 2).	Transfers that Injure Legal Users of Water or Cause Unreasonable Effects to the Environment - Water transfers that simply reclassify existing stream flows from one category to another, making these flows no longer available to historic downstream users, have the potential to injure other legal users of water and cause harm to the environment.
Groundwater Substitution - Reduction in surface water use that is offset with additional groundwater pumping (see Section 3).	

Key:

ETAW = Evapotranspiration of Applied Water

1.1 Developing a Water Transfer Proposal

Parties are encouraged to work with local water agencies and districts to develop coordinated water transfer proposals capable of providing substantial quantities of water.

- The amount of water made available for transfer by the seller is usually determined at the most downstream point of control of the seller. Losses beyond this point, including Delta carriage losses and conveyance losses, are allocated to the buyer or seller depending on the agreement between them, and, by the Project Agencies if the Project facilities are used.
- Proposals, contract negotiations, and California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) documentation must be completed before the water can be transferred. Water transfers involving CVP contract supplies and/or CVP facilities require the approval of Reclamation, and water transfers using SWP facilities require the approval of DWR.
- Proposals that require the State Water Resources Control Board (SWRCB) approval must be completed prior to conducting a water

transfer. Parties should obtain the SWRCB's approval as soon as possible, but no later than the start of the water transfer.

Figure 1-1 shows the general steps in the water transfer process for interested sellers. Depending on their water contract or water right, sellers would need to follow the water transfer processes of Reclamation, DWR, or SWRCB, recognizing it may be more than one. Reclamation and DWR work cooperatively in all water transfers that use Project facilities.

Although not necessarily of concern to the seller of water, a major concern to potential buyers is the ability to move the purchased water through the Delta to the buyer's service area. All water transfers across the Delta can only occur from July through September. DWR and Reclamation coordinate the operations of the Projects to meet Delta regulatory requirements pursuant to the Coordinated Operations Agreement. To get proper credit for transfer water moved through the Delta, both agencies must concur on the amount of water made available.

1.2 Environmental Documentation

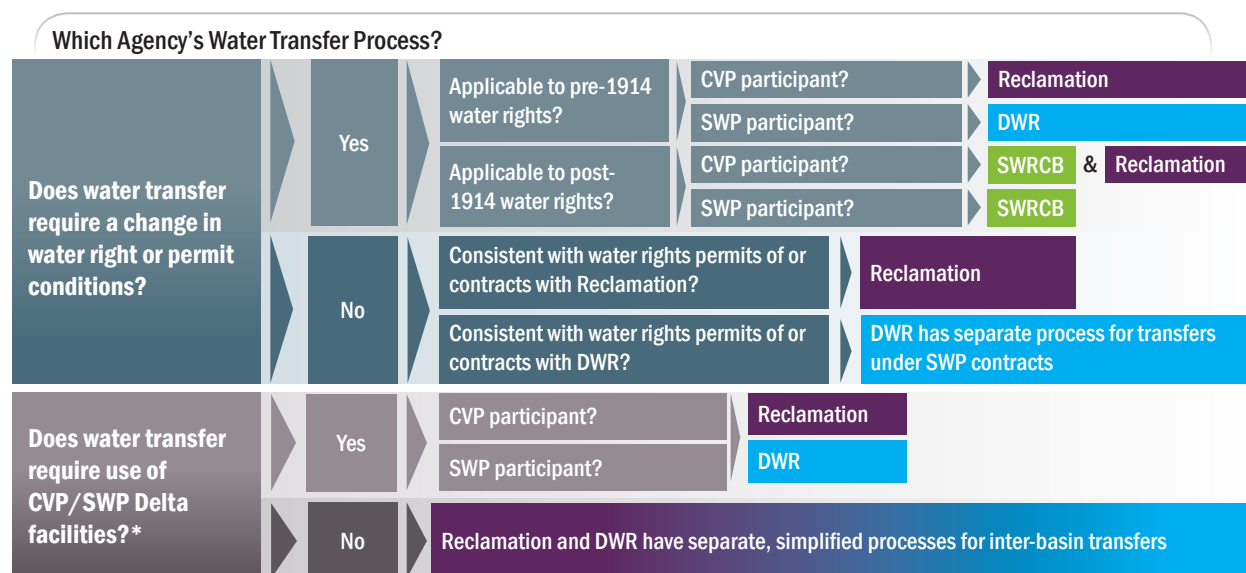
For 2010, sellers must complete appropriate CEQA documentation for transfers related to State actions.

Reclamation will complete NEPA documentation for transfers in 2010 related to Federal actions.

1.3 Water Right Changes and Protection

Depending on the type of water right held by the seller, a petition to the SWRCB for temporary transfer may be needed for some water transfers. Individual water right holders are responsible for obtaining changes to water rights from the SWRCB as needed. DWR and Reclamation will review potential transfers to determine if a Petition for Temporary Change is required to accommodate the transfer. Any transfer involving Project water must be consistent with the water right permits of DWR and Reclamation, water supply contracts, and State and Federal law and policies.

Figure 1-1 Short-Term Water Transfer Process Flowchart



**Reclamation and DWR work cooperatively to approve all transfers that use CVP/SWP facilities*

Agency Water Transfer Processes			
AGENCY	Reclamation	DWR	SWRCB
How to start agency process?	<ul style="list-style-type: none"> Send letter of request for transfer with information on seller, buyer, type, amount, and timing of transfer Reclamation sends letter back with cost reimbursement requirements Agencies agree to move forward 	<ul style="list-style-type: none"> Contact DWR with transfer proposal Agree to cost reimbursement 	<ul style="list-style-type: none"> File petition for temporary water transfer under Water Code Section 1725
What technical information is required in submittal packages?*	Information as listed in <ul style="list-style-type: none"> CVPIA Criteria Checklist for Complete Water Transfer Proposals Water Transfer Technical Information (crop shifting/cropland idling and groundwater substitution) 	Information as listed in Water Transfer Technical Information (crop shifting/cropland idling and groundwater substitution)	Information as listed in Petition Form for Temporary Transfer
What regulatory compliance is required?	NEPA and ESA (Reclamation has completed NEPA and ESA requirements for 2010 transfers)	CEQA (DWR requires transferor to complete CEQA documentation)	Water Code Section 1725 (Section 1725 process is deemed equivalent to CEQA for 1-year transfer)
What is acceptance of transfer proposals based on?	<ul style="list-style-type: none"> Complete Submittal Package Determination of real water and Project operation considerations CVPIA section 3405(a) – No adverse impacts on CVP contractors, water supply or operations, fish and wildlife obligations, and groundwater conditions in the transferor area NEPA – No adverse environmental impacts 	<ul style="list-style-type: none"> Complete Submittal Package Determination of real water and Project operation considerations Water Code Section 1810 - use of a water conveyance facility is to be made without injuring any legal user of water and without unreasonably affecting fish, wildlife, or other instream beneficial uses, the overall economy or the environment of the transferor area CEQA 	Water Code Section 1725 – Transfer would not injure any legal user of the water, and would not unreasonably affect fish, wildlife, or other instream beneficial uses.

**See checklists for data requirements*

California law protects the underlying water rights of those parties who wish to transfer a portion of their surface water supply to others. California Water Code Section 1745 et seq. protects the underlying water rights of the agency or individual transferring water from forfeiture.

1.4 Cost Reimbursement

The seller will be required to reimburse the costs incurred by Reclamation and DWR to review and approve the transfer proposal, and administer the transfer program. These costs will vary depending on the size and complexity of the transfer proposed.

1.5 Contacts

Parties interested in developing water transfer proposals that may require use of Project facilities and/or approval by DWR or Reclamation are encouraged to contact one of the individuals identified below early in the process.

- Dean Messer
Chief Water Transfers Office
DWR (916) 425-7175
dmesser@water.ca.gov
- Tim Rust
Program Manager
Reclamation (916) 978-5556
trust@usbr.gov

Section 2 Water Transfers Based on Cropland Idling and Crop Shifting

This section provides technical information on water made available for transfer by cropland idling/crop shifting. Cropland idling is not fallowed land, which is a normal farm operation and does not make water available for transfer. Cropland idling or crop shifting water transfers make water available by reducing the consumptive use of surface water applied for irrigation. Each proposal needs to make a credible case that reduction in surface water diversions will occur consistent with the reductions in consumptive use of applied surface water. Figure 2-1 shows the overall cropland idling/crop shifting transfer information required, which is summarized in the subsequent sections.

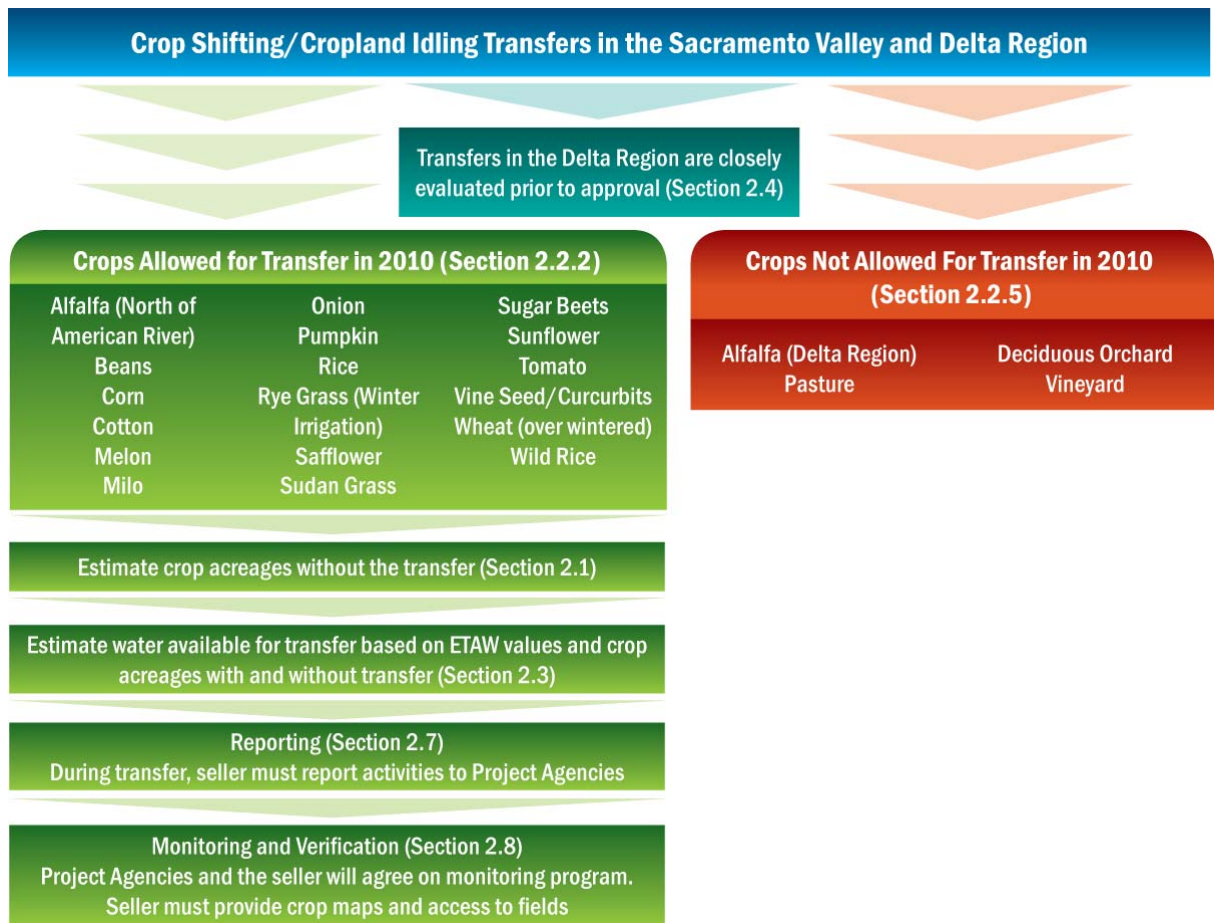


Figure 2-1
Cropland Idling/Crop Shifting Transfers Process Flow Chart

Accurate and complete data is essential for water transfers to be approved. Figure 2-2 summarizes the data needs for a cropland idling/crop shifting water transfer submittal package. Sellers must submit all data to facilitate review and processing of the water transfer proposal. The approval process will be quicker for sellers that have the technical aspects of their proposals properly documented to demonstrate that substantial quantities of water will be made available for transfer. Parties are encouraged to work with existing water districts and water agencies to develop joint water transfer proposals.

Cropland Idling/Crop Shifting Transfers Technical Information – Proposal Checklist	
<input type="checkbox"/>	Submit past 5 years* data of:
<input type="checkbox"/>	Net crop acreages by crop (acres)
<input type="checkbox"/>	Fallowed Land (acres)
<input type="checkbox"/>	Dry Farmed Land (acres)
<input type="checkbox"/>	Total District Acreage (acres)
<input type="checkbox"/>	Total Farmable Acreage (acres)
<input type="checkbox"/>	Maps showing:
<input type="checkbox"/>	District or Farm Operation Boundary
<input type="checkbox"/>	Current Fields Irrigated
<input type="checkbox"/>	Fields Routinely Irrigated or Not Irrigated
<input type="checkbox"/>	Fields to be Idled as Part of Water Transfer
<input type="checkbox"/>	Basis of right to use surface water during the spring and summer in the year of the proposed water transfer
<input type="checkbox"/>	ETAW
<input type="checkbox"/>	Base Year ETAW (Acre-feet)
<input type="checkbox"/>	Current Year ETAW (Acre-feet)
<p><i>*With Project Agencies approval, 5 years of crop data may not be necessary for large water districts that can prove cropping patterns have changed very little from year to year.</i></p>	

Figure 2-2
Crop Idling Technical Information Submittal Proposal Checklist

2.1 Estimation of Conditions That Would Occur Absent the Transfer

A key element of a cropland idling and crop shifting water transfer is to determine the conditions that would exist without the transfer.

Predicting such conditions accurately is often difficult. The use of historical cropping patterns is currently the best method to estimate conditions that would exist absent the cropland idling/crop shifting transfer. The crop history identifies the type of crops typically grown, the degree of land idling that typically takes place, and the crop rotation practices that typically occur.

To estimate conditions that would occur without a transfer, sellers must provide the following information:

- Accurate crop records for the five years immediately preceding the year of the proposed transfer. Crop acreage should be reported in net field acres of the actual farmed and irrigated acres. If only gross field acres are known (i.e., the county parcel acres), then multiply the gross acres by 0.95 to estimate net acres. Crop acreage needs to be included for each crop (include fallowed lands, non-irrigated crops, and total farmable acres) for the water district or individual farm operation.
- Maps showing district or farm operation boundary, current fields irrigated, fields routinely idled or not irrigated, and fields to be idled as part of the proposed water transfer, in a format acceptable to the Project Agencies.
- The basis of right to use surface water during the spring and summer in the year of the proposed water transfer.

The following sections further describe how this information will be used to determine conditions without the transfer.

2.1.1 Large Water Districts

The term water district is used in this paper as shorthand to include any water company, district, agency, or other entity that provides water service to a group of landholders and can enter into a binding contract with a buyer. Large water district is defined as a legal entity serving multiple land owners. If only a few individual landowners within the water district wish to participate in the transfer, they should coordinate with their water district and refer to Section 2.1.2 on methods to calculate expected water savings.

A water district's previous year crop acreage is typically the best indication of the next year's crop patterns, provided the market for the particular crops grown remains relatively stable, the water supply has not been affected by droughts, and the acreage of the one or two crops with highest water use is typical of past years. The average acreages for these high water use crops in each district needs to be reviewed as follows:

- If acreage values for the crops with the highest water use for the immediate prior year are within five percent of the five-year average for these crops, then the last year's cropping patterns will be used as the base for calculating changes due to the crop shifting and idling transfer.
- If acreage values for the crops with high water use fall outside this range, then another more typical year or an average of cropping patterns and acreages will be used, as mutually agreeable between the applicable Project Agency and the party proposing the water transfer.

The previous year's data may also be used if additional explanation is provided to the Project Agencies, and the parties proposing the transfer and the Project Agencies agree that this is the best representation of conditions that would exist absent the cropland idling and crop shifting transfer. In this case, five years of crop data may not be needed. If DWR and/or Reclamation and the water district cannot reach agreement on an estimate of the conditions that would likely exist absent the cropland idling and crop shifting transfer, then the Project Agencies will not approve the proposed transfer based on that cropland idling or crop shifting.

2.1.2 Individual Farm Operations and Small Water Districts

Small water district is defined as a legal entity that serves one or few land owners. For individual farm operations or small water districts, last year's cropping patterns may be an inappropriate measure of likely future conditions absent the cropland idling/crop shifting transfer because of crop rotation patterns.

Small water districts and individual operations must provide the previous five years of crop history for their entire district or operation to identify significant crop rotation cycles. Where crop rotation cycles are evident for the whole of the farm operation or small water district, either (1) a repeating crop pattern or (2) the five-year average should be used. In these cases, the potential participant has to identify specific fields to be enrolled in the transfer and provide the five-year crop history for these fields, at a minimum. Use of a repeating pattern to characterize routine land idling and crop rotation practices requires the proponent to

provide an exact repeating pattern of cropland idling practices for the fields to be involved in the transfer. The lands considered routinely idled would correspond to those in the subsequent year of the pattern. The Project Agencies must agree to use of a repeating pattern.

From this crop history, the proponent must calculate the five-year average of crop ETAW values, as indicated below, for each field. The five-year average ETAW values for each field would be used as the base for determining changes due to the proposed cropland idling/crop shifting transfer in the year of the transfer. Individual farms or small water districts must provide a statement that the land idled for water transfer is not “shifted” to other operations under their control.

2.2 Use of Evapotranspiration of Applied Water (ETAW)

2.2.1 What is ETAW?

ETAW is defined as the portion of applied surface water that is evaporated from the soil and plant surfaces and actually used by the crop. The portion of the crop evapotranspiration met by precipitation occurring during the growing season or stored as soil moisture within the root zone before the growing season does not qualify as transferable water. Although the quantity of applied surface water required for a given crop may vary from one year to the next because of changing weather conditions, ETAW values used for water transfer calculations are based upon crop water requirements reflecting average rainfall and evaporative demand.

The calculation of water made available for transfer is based upon the quantity of surface water conserved for each qualifying idled acre of cropland and the appropriate ETAW associated with changes in the specific crops idled. ETAW does not include the quantity of irrigation water typically lost as deep percolation to groundwater or ditch conveyance losses. The quantification of these depletions is difficult and unless the idled acreage overlies an unusable groundwater basin or discharges to a saline sink, these depletions typically contribute to the overall water supply. Therefore, the use of ETAW is a reasonable estimate of new water made available for export due to crop shifting or idling.

2.2.2 Crops Allowed for Shifting or Idling and ETAW Values

Table 2-1 shows the crop ETAW values in the Sacramento Valley for use in 2010 water transfers.

**Table 2-1. Estimated ETAW Values
(in acre-feet/acre) For Crops Suitable for
Shifting or Idling in 2010**

Crop	ETAW (in af/acre)
Alfalfa ¹	1.7 (July – Sept)
Bean	1.5
Corn	1.8
Cotton	2.3
Melon	1.1
Milo	1.6
Onion	1.1
Pumpkin	1.1
Rice	3.3
Rye Grass (Winter Irrigation)	0
Safflower	.7
Sudan Grass	3.0
Sugar Beets	2.5
Sunflower	1.4
Tomato	1.8
Vine Seed/ Cucurbits	1.1
Wheat (over wintered)	0.5
Wild Rice	2.0

¹ Only alfalfa grown north of the American River will be allowed in 2010 transfers but fields must be completely disced on, or prior to, July 1 of transfer year.

2.2.3 Rice Idling

Rice idling constitutes the majority of crop idling transfers. Through 2009, the quantity of transfer water made available has been calculated based on the pattern of ETAW rather than the timing of river diversions. The Project Agencies recognize that due to the unique cultivation requirements of rice, the diversion pattern differs from the ETAW pattern and are currently evaluating the technical issues related to selecting the appropriate method for calculating the timing of water availability for rice idling. For the purpose of evaluating transfers in 2010, the Project Agencies will use the ETAW pattern to determine the timing of water available for transfer for rice idling and will continue to work on a resolution of this issue for future transfers.

Irrigated rice fields and irrigation/drainage ditches can provide temporary or permanent forage and habitat for terrestrial wildlife and waterfowl species, including the Giant Garter Snake. Appendix B lists conservation measures for rice idling to protect species.

2.2.4 Rice Straw Decomposition

The Project Agencies are currently investigating potential water savings from rice straw decomposition including the use of groundwater

substitution for rice straw decomposition water or using mechanized or other removal methods. The Project Agencies are investigating possible approaches regarding rice decomposition water transfers, but cannot guarantee that an acceptable approach will be developed in time for the 2010 water transfer season.

2.2.5 Limitations on Crops and Lands

Some crops are not eligible for idling or shifting transfers because it too difficult to determine the real water savings from a lack of authoritative ETAW values, substantial variability in cultural practices, and other crop specific reasons. Table 2-2 lists the crops that are not acceptable to Project Agencies for idling or shifting transfers in 2010. The Project Agencies will not approve water transfers that propose idling or shifting of these crops.

Table 2-2. Crops NOT suitable for Shifting or Idling in 2010

Crop
Pasture ¹
Alfalfa (in the Delta Region)
Deciduous Orchard
Vineyard

¹ The Project Agencies are evaluating use of pasture for future cropland idling/crop shifting transfers; however, it will not be allowed in 2010.

Some specific practices and proposals are not acceptable for water transfers due to the difficulty in determining the amount of water made available or the uncertainty in what would have happened absent the transfer. These include:

- Removal of permanent crops.
- Fields historically irrigated by groundwater.
- Crop shifting on lands where groundwater is within five feet of the land surface or where the crop root zone may extend into the groundwater table. In these areas, cropland idling is the preferred practice.
- Where increased water use on other lands within the transferring water district or within the control of the transferring party offsets the volume of water conserved through crop shifting or cropland idling.

In order to get the full credit for the expected water savings, idled land cannot be irrigated during the transfer season. The calculation of consumptive use savings for crop idling assumes that the idled field will be kept dry and free of weeds. Seepage from adjacent irrigation and drainage canals or areas with high groundwater can result in consumption of applied water by vegetation growth on idled fields, thus reducing effective water savings from crop idling. In 2009, most fields were disced and essentially free of excessive vegetation or contained remnant winter vegetation that was essentially dry by mid June. However, there were isolated fields on which weed growth, due to excessive seepage, was noted. On idled lands in the Sacramento Valley, special actions to remove weeds will not be required in 2010 except in areas subject to high groundwater tables or excessive seepage. Growers participating in water transfers are expected to control seepage onto idled lands to the best of their ability. If lands are included that are subject to high water loss from idled fields, a measurement and monitoring program may be required to estimate the consumptive use due to excessive weed growth and soil evaporation. Excessive weed growth on idled acreage will lead to a reduction in the verified quantity of water made available for transfer.

2.3 Estimating Water Available for Transfer

2.3.1 Large Water Districts

Large water districts need to evaluate the crop acreage that would have existed absent the transfer using the methods presented in Section 2.1.1, including the acreage for each crop, idled lands, and all other district lands. Base year ETAW values can be calculated using the baseline crop acreages and ETAW values in Table 2-1. The district should then determine the acreages of each crop, fallowed lands, and other lands expected in the coming year with the water transfer. Using these acreages, the ETAW for the coming year is calculated by the same method used for the base year. The base and expected current year crop acreages for the district should be checked to make sure they match. The difference between the base and current year ETAW is used to estimate the water made available by the cropland idling/crop shifting transfer.

2.3.2 Individual Farm Operations or Small Water Districts

As stated in Section 2.1.2, individual farm operations and small water districts may exhibit significant crop rotation sequences and may wish to simply enroll specific land parcels into a cropland idling/crop shifting program. In these cases, Section 2.1.2 describes the method to establish a baseline cropping pattern that will allow calculation of the baseline ETAW for each parcel. The ETAW for the parcel for the current year with the water transfer is then established. The difference between the

base and current year ETAW is used to estimate the water made available by the cropland idling/crop shifting transfer.

2.4 Potential Cropland Idling/Crop Shifting Transfers in the Delta/Yolo Bypass Region

The Project Agencies are working to increase options for transferrable water via cropland idling/crop shifting, if options result in real water savings that can be made available at times and locations such that it can be exported by the Projects. In 2010, the Project Agencies will evaluate proposals for transfers originating in the Yolo Bypass/Tule Canal or Delta areas on a case by case basis. Many uncertainties exist with transfers originating from the Yolo Bypass/Tule Canal or Delta including how much water can be made available and whether the transfer water can be exported by the projects. The Project Agencies will closely scrutinize each Delta transfer proposal.

Sellers must consult with the SWRCB and obtain written approval that the transfer water can be accounted for separately as meeting the flow related compliance objectives in D1641. The Project Agencies must also be assured that hydraulic connectivity with the Delta exists at all times during the transfer period. If the seller can obtain specific approval from the SWRCB, extensive measurement, monitoring and reporting requirements, acceptable to the Project Agencies and paid for by the transfer proponents, will be required to determine and verify transferable water. Sellers must contact the Project Agencies for minimum measurement and monitoring requirements. The Project Agencies will work with each seller on a case by case basis for any transfers from the Delta region.

2.5 Limitations on the Water Made Available for Transfer

Cropland idling/crop shifting water transfers typically make water available in the late spring and summer on a pattern that follows the ETAW of the particular crop idled. The transfer of water made available may require a change in place of use which requires the approval of the SWRCB for diverters operating under a post 1914 water right. Export of the transfer water by the Project Agencies through the Delta is dependent on availability of capacity at the CVP or SWP pumping facilities; and subject to other operational requirements. Available CVP and SWP capacity is severely limited due to operational and regulatory restrictions. The pumping window for transfers is currently July through September. Pumping within this window can be further reduced based on specific hydrologic conditions and regulatory

compliance or water quality issues. The Projects cannot guarantee that a specific quantity of transfer capacity will be available.

To capture water available for transfer outside the July through September transfer window, water would need to be held in an upstream reservoir, which is difficult given operational constraints of the Projects. Sellers may be able to negotiate operational agreements to allow water to be stored within the Project Agencies' facilities on a case by case basis.

2.6 Adjustments for Water Shortage Years

The baseline to determine water available for transfer is typically based on prior year cropping patterns within the water district or individual sellers' service area. If hydrologic conditions are sufficiently dry, sellers' water supply allocations may be reduced making it difficult to establish what the cropping pattern would have been in the absence of the transfer. The following approach will be used to determine baseline acreages in 2010; however, the Project Agencies will analyze the baseline for all transfers based on their unique circumstances.

Is the Seller Facing a Reduced Surface Water Supply During 2010?

1. No: If no, and the seller transferred water in 2009, the baseline for the 2009 transfer is the 2010 baseline. If the seller did not transfer water in 2009, an appropriate baseline must be determined. Methods to determine the baselines are described in the previous sections.

2. Yes: If yes, will the reduced supply require reduced consumptive use?

If no, submit data to the Project Agencies to illustrate how the seller will accomplish meeting full consumptive use with reduced surface water supply; include historical diversion data, additional recycling, or other conservation measures. Additional groundwater pumping is an increase to the groundwater baseline for transfer purposes.

If yes, then the baseline for the seller will be based on a calculated ratio of the "District efficiency" or ETAW/Diversions.

Under no circumstances will a seller be allowed to transfer more water through cropland idling/crop shifting than the difference between their 2010 surface water allocation and their 2010 actual diversions.

2.7 Reporting

Accurate reporting of the activities undertaken as part of a cropland idling/crop shifting transfer is an essential provision of any water

transfer approval. Reporting is the responsibility of the seller and needs to be acceptable to the Project Agencies.

2.8 Monitoring and Verification

Verification of the actions taken to make water available in a cropland idling/crop shifting transfer will be conducted by the Project Agencies or by sellers, if approved by the Project Agencies. In addition to crop mapping, the following information will need to be provided.

The monitoring program must allow for acquisition of field data that can be used to verify how much water was actually made available by the transfer action(s) and to modify future proposals if warranted. Elements in a cropland idling/shifting monitoring program are listed below.

- Past years and current year cropping data.
- Map showing lands participating in the water transfer.
- Field checks by Project Agency staff to verify no water leakage onto idled lands, check for excess weed growth on idled fields, and determine change in soil moisture content. Verify shift to crop indicated.
- Previous and current year diversions for district programs.
- In areas subject to high groundwater or excessive seepage, instrumentation adequate to determine soil evaporation and weed transpiration necessary to calculate reductions in conserved water savings and acceptable to the Project Agencies.

Crop mapping information is the responsibility of the seller. The seller will also provide access to the fields that are part of the cropland idling/shifting transfer so that the approving agency can perform field checks and determine soil moisture depletion. DWR and Reclamation will coordinate verification activities. Costs associated with field monitoring and verification are considered reimbursable by the Project Agencies (see Section 1.4).

2.9 Third Party Effects

Acreage idled for the purpose of a water transfer must be dispersed to minimize impacts on terrestrial wildlife and waterfowl species that may use irrigated croplands or irrigation/drainage ditches for temporary or permanent forage and habitat purposes. Normal farm operations for

idled lands are expected to continue. Specific practices that may need to be implemented to transfer water in 2010 can be found in the 2009 DWB Biological Opinion (see Appendix B).

Cropland idling/crop shifting transfers have the potential to affect the local economy. Parties that depend on farming-related activities can experience decreases in business if land idling becomes extensive. Limiting cropland idling to 20 percent of the total irrigable land in a county should limit economic effects.

Water districts and others participating in cropland idling/crop shifting transfers need to be sensitive to the possible economic impacts of their actions on their business partners and their neighbors. Sellers should be aware of water transfers in neighboring districts to monitor for potential cumulative effects. Geographically distributing the acres that are idled can avoid or minimize possible economic effects.

Water Code Section 1745.05 (b) provides that if the amount of water made available by land fallowing (idling) exceeds 20 percent of the water that would have been applied absent the proposed water transfer, a public hearing by the water supply agency is required. In the past, cropland idling programs have stayed well below the 20 percent water delivery threshold for a hearing. Water supply agencies interested in participating in cropland idling/crop shifting transfers need to be aware of this water code section and conduct a public hearing if they propose a transfer in which cropland idling would exceed the 20 percent threshold.

Section 3 Water Transfers Based on Groundwater Substitution

This section provides technical information to local parties who wish to transfer water in 2010 through groundwater substitution. Groundwater substitution transfers make surface water available for transfer by reducing surface water diversions and replacing that water with groundwater pumping. Water made available through transfer can be moved through the Delta from July through September; groundwater substitution transfers must be coordinated with availability at the export pumps.

The rationale behind a groundwater substitution transfer is that surface water demands are reduced because a like amount of groundwater is used to meet these demands. The resulting increase in available surface water supplies can be transferred to other users. Because of potential surface water–groundwater interaction, the net amount of additional surface water supply created through groundwater substitution transfers must account for: 1) the amount of increased pumping that occurs in support of the transfer; 2) the effects that decreased stream flow (associated with transfer-related groundwater pumping) has on the initial increase in available surface water supply; and 3) the timing of those decreases in available surface water supply.

A groundwater substitution transfer proposal generally consists of the following components:

- The location and characteristics of the wells that will be pumped.
- The volume and schedule of transfer-related groundwater pumping.
- Monitoring plan designed to assess the effects of the transfer.
- Mitigation strategy to alleviate possible injury issues.

The detailed requirements for a proposal are included in Figure 3-1 and discussed below in more detail.

Figure 3-1 Groundwater Substitution Transfers Technical Information – Proposal Checklist

Submit the following information to the Project Agencies for review and approval prior to the beginning of the transfer.

- ☐ Surface water source that will be replaced by groundwater pumping
- ☐ Location and construction details of wells that will be pumped
 - ☐ Well Identification: Well owner name and identification number, water district, and district's well identification number
 - ☐ Well Location: Latitude and longitude, Township, Range and Section, map (similar detail to 7.5 minute USGS quad sheet) with well location and all surface water within two miles of District boundary
 - ☐ Well Construction: well depth, depth of annular surface seal, gravel pack intervals, casing size, casing perforation interval, and well's construction method
 - ☐ Geologic Log
 - ☐ Estimated Well Capacity
 - ☐ Photographic evidence of the calibrated instantaneous reading and totalizing flow meters installed on each participating well
 - ☐ Certification by a Professional Engineer or Professional Geologist for accurate flow meter installation
 - ☐ Estimates of stream flow depletion calculated using approved numerical hydrologic models; or when modeling information is not available, use of the well criteria (Appendix B) and streamflow depletion factor (12%)
 - ☐ Additional Information (If available): PG&E well efficiency test, independent well drawdown tests, water quality data, and/or site-specific studies with aquifer properties surrounding the well or extent of the well's hydrologic connection with any surface waters
 - ☐ Pump Power: Verification of an electric source for well, or if diesel pump, verification of compliance with Air Board Regulations
- ☐ Schedule and volume of water to be pumped
 - ☐ Proposed Operations: Description of the well's projected operation, the projected beneficial use of pumped water, and verification that a totalizing flowmeter has been installed and calibrated
- ☐ Baseline from which the additional pumping will be measured
 - ☐ Historic Operations: Operation records indicating the volume of water pumped from each well in 2009.

Monitoring program - submit the monitoring plan to the Project Agencies at least two months prior to the groundwater substitution transfer. The seller shall begin the monitoring program at least one month prior to the proposed transfer.

- ☐ A monitoring well network that adequately covers the surface area and aquifer intervals within the affected pumping area
- ☐ Periodic meter readings of instantaneous flow (gpm) and total discharge volume at each of the groundwater substitution wells
- ☐ Groundwater level measuring of sufficient frequency and duration
- ☐ Groundwater quality monitoring (when groundwater pumping is initiated, monthly during the transfer period, and at the termination of pumping)
- ☐ Method to detect land subsidence or that subsidence is unlikely to occur
- ☐ Plans to coordinate data collection and cooperate with regional monitoring efforts
- ☐ Data evaluation, logging and reporting

Mitigation Plan - submit a mitigation plan to the Project Agencies at least two months prior to the groundwater substitution transfer.

- ☐ A procedure for the seller to receive reports of purported environmental or third party effects and to report that information to the Project Agencies and, as required, to local agencies
- ☐ A procedure for investigating any reported effect
- ☐ Development of mitigation options, in cooperation with the affected third parties, for legitimate effects
- ☐ Assurances that adequate financial resources are available to cover reasonably anticipated mitigation needs

3.1 Compliance with Local Groundwater Management Plans and Ordinances

Compliance with local requirements (including ordinances relating to well drilling and groundwater extraction) and local groundwater management plans, as well as compliance with adjudications and with the overdraft protections in Water Code Section 1745 *et seq.* will be the responsibility of the entity proposing the groundwater substitution transfer.

Individual county requirements vary throughout the Sacramento Valley. The approval process associated with a proposed groundwater substitution transfer varies by county and may take a significant amount of time. Table 3-1 provides brief descriptions of the water transfer requirements for individual counties, in geographic order from north to south. Potential sellers are advised to contact the counties early to discuss the requirements for water transfer approval.

Table 3-1. Description of County Ordinances and Plans Pertaining to Groundwater Transfers

County	Description	Sources for More Information
Shasta	Ordinance pertaining to the Redding Groundwater Basin portion of Shasta County requires a permit for extraction and export of groundwater, either directly or indirectly, for use outside of the County. Application for a transfer permit should be submitted to the Chief Engineer of the Shasta County Water Agency.	Shasta County Water Agency. http://www.co.shasta.ca.us/html/Public_Works/docs/AB3030_%20Apx-A.pdf
Tehama	Ordinance requires a permit to extract groundwater for off-parcel use, prohibits mining of groundwater, and restricts the radius of influence associated with the operation of a well participating in transfer operations to the parcel on which the well is located, among other requirements.	Tehama County Health Agency, Environmental Health Division http://www.tehamacountywater.ca.gov/ http://www.tehamacountywater.ca.gov/exp_ord_1617.htm
Butte	Ordinance requires permits for groundwater extraction for use outside the County, and requires a permit for groundwater substitution pumping. Butte County also has a well spacing ordinance. The Butte County Water Commission advises the Board of Supervisors with technical information from the Butte County Water Advisory Committee and Technical Advisory Committee.	Butte County Department of Water and Resource Conservation http://www.buttecounty.net/Water%20and%20Resource%20Conservation.aspx
Glenn	Ordinance uses basin management objectives of groundwater levels, groundwater quality, and land subsidence to help define safe yield and overdraft of the basin. The ordinance is enforced by the Glenn County Board of Supervisors	Glenn County Department of Agriculture http://www.glenncountywater.org/about_us.aspx

Table 3-1. Description of County Ordinances and Plans Pertaining to Groundwater Transfers

County	Description	Sources for More Information
Colusa	Ordinance requires a permit for extraction and export of groundwater, either directly or indirectly, for use outside of the County. Application for a transfer permit is filed with Colusa County Groundwater Commission, through the Director of the Planning and Building Department.	County Director of Planning and Building http://www.codepublishing.com/CA/colusacounty/ http://colusagroundwater.ucdavis.edu/index.htm
Sutter	Sutter County has no ordinance governing the extraction and export of groundwater. According to its general plan, Sutter County has a long-term interest in discouraging water transfer/export sales if they result in long-term supply losses.	Sutter County Planning Services http://www.co.sutter.ca.us/doc/government/depts/cs/ps/gp/gp_home
Yolo	Ordinance requires a permit for extraction and export of groundwater, including the extraction of groundwater to replace a surface water supply. Application for a permit should be filed with the Director of Community Development.	Director of Community Development http://www.yolocounty.org/Index.aspx?page=432#Title%2010
Sacramento	Ordinance requires a permit for groundwater or surface water to be transported in any manner outside the County. Application for a permit must be filed with the Director of the Sacramento Department of Water Resources.	Sacramento Department of Water Resources http://www.msa.saccounty.net/waterresources/drainage/docs/20051018Title3Zone41MASTERrev.pdf
Solano	At this time, Solano County has no ordinance governing the extraction and export of groundwater.	

3.2 Evaluation of Groundwater Substitution Transfer Proposals

Before beginning transfer operations, the water transfer proponent will need to develop a groundwater substitution transfer proposal and provide it to the Project Agencies for evaluation.

The Project Agencies will review groundwater substitution transfer proposals to determine whether they meet the following objectives:

- Transfer operations will result in providing the agreed-upon amount of transfer water.
- Transfer will have no significant unmitigated environmental effects.

- Potential adverse effects to other legal users of water are minimized.
- Proposal provides a process for review and response to reported third party effects.
- Proposal shows that a monitoring and mitigation strategy is in place prior to the transfer.

The Project Agencies need sufficient information to determine whether the transfer will meet the desired objectives. The following sections provide the information to be submitted with the proposal.

3.3 Groundwater Substitution Wells

The Project Agencies will conduct a well review to determine whether the proposed wells are suitable for use in a water transfer operation and meet the above objectives.

Sellers must provide sufficient information, described below, to help the Project Agencies conduct the well review. Wells will be considered ineligible for transfer-related pumping if review of location and construction demonstrates:

- Sufficient information is not available to estimate a well's potential effects; or
- A well is completed in unconfined aquifers that are likely to be hydrogeologically continuous with a streambed or other surface water feature.

3.3.1 Information Requirements for Water Transfer Wells

The transfer proponent must submit the following information to the Project Agencies for review and approval prior to the beginning of the transfer. Appendix C lists well acceptance criteria. For wells accepted for 2009 transfers, sellers can resubmit data from 2009, assuming there were no changes to the well. However, verification of calibration may need to be submitted annually for each well; sellers should consult with Project Agencies prior to submitting proposal.

1. Well Identification: Well owner name, well owner's identification number, water district or agency where well is located, and the water district or agency's well identification number (if different from well owner's identification number).
2. Well Location:

- a. Latitude and longitude and the Township, Range and Section. The location can be determined with a hand-held Global Positioning System (GPS) unit or instrument with greater measuring precision.
 - b. A map, with at least as much hydrologic and physical detail as that of a 7.5 minute United States Geologic Service (USGS) quadrangle sheet, showing the location of all wells that will be involved in the transfer and the location of all surface water features within two miles of the District service area boundary.
3. Historic Operations: Operation records indicating the volume of water pumped from each well in 2009. Records of power consumption may be submitted in place of flow measurements from a totalizing flow meter.
4. Proposed Operations:
 - a. Description of the well's projected operation (e.g., is groundwater to be applied to surrounding land, or is groundwater to be pumped into district canals, etc.), and the projected beneficial use of pumped water.
 - b. Verification that a totalizing flowmeter has been installed and calibrated.
5. Well Construction: Provide total well depth, depth of annular surface seal, gravel pack intervals, casing size, casing perforation interval (or open hole interval), and well's construction method (cable tool, rotary gravel pack well, etc.).
6. Geologic Log: Details of geologic materials described on the well log.
7. Estimated Well Capacity: Identify estimated well capacity and method for determining capacity.
8. Additional Information: If available, provide results of a Pacific Gas and Electric (PG&E) well efficiency test, independent well drawdown tests, water quality data, and/or site-specific studies that document aquifer properties surrounding the well or extent of the well's hydrologic connection with any surface waters.
9. Pump Power: Wells powered by an electric source are eligible for use in transfers. Wells powered by diesel or gasoline engines are eligible for use in the transfer if the seller complies with applicable air quality regulations and provides appropriate mitigation.

The amount of information submitted for each well will depend on its location relative to surface water features and other areas that may be sensitive to groundwater pumping effects. The Project Agencies will require site access for field verification of the above information, and collection of additional data during the program.

3.4 Determining the Amount of Transferable Water

Transferable water equals the increase in Sacramento River flow to the Delta created by transfer operations during balanced Delta conditions. Balanced Delta conditions means those spans of time when the Project Agencies agree that releases from upstream reservoirs plus unregulated flow approximately equal the water supply needed to meet Sacramento Valley in-basin uses plus exports. Sacramento River flow increases as sellers use groundwater pumped from wells to replace surface water provided by river diversions. The resulting increase in stream flow is reduced to varying degrees because the groundwater pumping affects stream flow.

The Project Agencies will use information from transfer proponents to calculate the amount of water provided by transfer operations. The amount of transferable water credited to a groundwater substitution water transfer operation in 2010 will be determined as follows.

1. Establish the baseline for a transfer operation.
2. Determine the difference between groundwater pumping in 2010 and the baseline.
3. Determine the reduction in stream flow during balanced Delta conditions resulting from pumping groundwater to make surface water available for transfer.
4. Calculate the difference between 2 and 3, above.

The next sections describe these steps.

3.4.1 Determining the Groundwater Baseline

The baseline is the amount of groundwater pumping that would have occurred without the transfer. For water transfers in 2010, the Project Agencies will use the 2009 records of groundwater pumping submitted by the seller to establish the baseline. Sellers are requested to submit the following information for non-transfer pumping years.

- Sellers are to identify all wells in the contiguous water supply delivery system within which a well is proposed for use in the transfer program.
- Sellers are to submit information indicating the amount of groundwater pumped in 2009 for each well in the contiguous water supply delivery system.

The Project Agencies will calculate baseline pumping based on the total volume pumped from all wells in a contiguous water supply delivery system in non-transfer years. Newly participating sellers may be allowed to use records of electrical power consumption along with well efficiency test data to estimate baseline groundwater pumping.

If sellers experience cutbacks of their normal surface water allocation in 2010, the estimated amount of baseline pumping will be determined on a case-by-case basis after consultation with the seller.

3.4.2 Measuring Groundwater Pumped

Flow information from all wells in a contiguous water supply delivery system participating in groundwater substitution transfers will be required. An instantaneous reading and totalizing flow meter shall be installed on each well participating in groundwater substitution water transfers. The flow meter shall be installed such that:

- Each flow meter is in good working order and properly sized, positioned, and oriented on the discharge piping to ensure accurate measured flows;
- Discharge piping is configured to ensure that pipe-full flow conditions are met where the meter is installed; and
- The manufacturer's standards for calibration, sizing, positioning, and orientation for the meter are followed.

A qualified professional should certify each well flow meter installation for conformance with the manufacturer's specifications prior to use. Project Agencies may conduct independent field checks of meter installations to verify the information provided and manufacturer's standards are met.

Participants shall provide a photo of each well flow meter installation, including the well and associated plumbing, for each participating well.

An exception to the above accounting method for groundwater substitution transfers applies to districts that could provide water from their own reservoirs and replace it with groundwater pumping. If a

reservoir controls flow to a stream where gauges are sufficiently precise, and stream flow is sufficiently low that the Project Agencies can use stream gauge data to determine how much water is being provided for transfer, the stream gauge data may be used in place of totalizing flow meters on individual wells. In these cases, additional analysis of reservoir operations may be required to determine if transfer operations must consider reservoir refill criteria. Data requirements for transfer proponents that can operate a groundwater basin in conjunction with their own reservoir will be determined on a case-by-case basis.

The development of a water transfer proposal must take into account that a district's total diversion of surface water during the year shall not exceed the maximum amount provided under its water service or settlement contract with the United States, or its water service contract with DWR, or their appropriative water rights, less the total quantity of groundwater provided by wells within a district pumping under a groundwater substitution transfer agreement.

3.4.3 Estimating the Effects of Transfer Operations on Stream Flow

Groundwater pumping for transfer operations will yield water at the expense of future stream flow. Flow reduction in a river, stream, canal, or drain that is tributary to the Delta could injure other legal users of water. However, if transfer-related stream flow losses occur when the Delta is in excess conditions, the effect of the transfer operations does not injure the Projects' water supply.

For water transfers in 2010, the Project Agencies will use the well criteria detailed in Appendix C to approve wells suitable for transfers and assume that stream flow losses due to groundwater pumping for transfers are 12 percent of the amount pumped for transfer. This depletion factor will be applied to all wells participating in transfers. The Project Agencies will revise the 12 percent factor in future years as additional information becomes available.

Available local hydrologic models can be used to determine effects on stream flow. The Project Agencies must approve use of the model and results. The 12 percent depletion factor will be applied if existing models are not available or approved by the Project Agencies.

3.5 Monitoring Program

When water is transferred, California law protects other legal water users, the environment, and the source area economy. Groundwater substitution transfers have the potential to cause injury to local groundwater users due to the additional groundwater pumping needed to allow the surface water transfer to take place. Injury could also occur to

other surface water users if the additional groundwater extraction results in a significant reduction to stream flow at a time when those users need it.

Sellers transferring water in 2010 via groundwater substitution transfers must demonstrate to the Project Agencies that they have an established monitoring program to identify any adverse transfer-related effects before they become significant. The Project Agencies will evaluate the monitoring program for its ability to meet the objectives listed below. The regional extent and frequency of monitoring necessary to meet objectives will depend on site-specific factors. For instance, areas that are susceptible to land subsidence may require extensometers, while areas with groundwater quality concerns may require a more comprehensive set of groundwater quality laboratory tests.

The seller will submit the monitoring plan to the Project Agencies at least two months prior to the groundwater substitution transfer. The seller shall begin the monitoring program at least one month prior to the proposed transfer.

3.5.1 Monitoring Plan Objectives

The monitoring plan needs to describe how the seller will collect, evaluate, and report the monitoring data in order to meet the following objectives.

- Accurately account for the quantity of groundwater pumped in-lieu of surface deliveries.
- Determine the extent of surface water/groundwater interaction in the areas where groundwater is pumped for the transfer.
- Assess the effects of the transfer on the existing groundwater system.
- Determine the direct effects of transfer pumping on the groundwater basin, including any residual effects until full recovery of pre-project water levels occurs or seasonal high levels occur in the spring following the transfer.
- Assess the magnitude and significance of any third party effects to other legal users of water, other in-stream beneficial uses, the environment, and the economy.
- Comply with Federal and State laws and local ordinances consistent with State law.

- Coordinate the monitoring program with other established programs in the area.

Water transfers may not cause significant adverse effects to nearby Federally reserved Indian Trust Assets. Proposed transfers near Indian Trust Assets may require additional monitoring commitments, such as increased frequency of groundwater level measurements.

3.5.2 Monitoring Program Elements

To meet the objectives, a monitoring program will contain the following elements at a minimum.

Monitoring Well Network

The seller will provide evidence that the monitoring well network addresses the location of production wells, the construction of both the monitoring and production wells, the location of third party wells and the relationship of production wells to surface water bodies and any contaminated areas that could be affected by pumping. The monitoring program will incorporate a sufficient number of monitoring wells to accurately characterize groundwater levels and response in the area before, during, and after transfer pumping takes place. Selling agencies will submit a map showing the location of the monitoring wells in relation to the extraction wells that would be used during the transfer. Monitoring wells should be listed in a table showing well owner, well name or owner's number, State Well Number, well type, and well location using latitude and longitude. (A well's geographic coordinates may be determined with a handheld GPS instrument.)

Groundwater Pumping Measurements

All wells pumping to replace surface water designated for transfer shall be configured with a permanent instantaneous and totalizing flow meter (capable of measuring well discharge rates and volumes). Flow meter readings will be recorded upon initiation of pumping and at designated times, but no less than monthly, during the duration of the transfer. The seller will calculate and report the quantity of water pumped between successive readings. In addition, the seller will record electric meter readings and make the records available to the Project Agencies for audit upon request.

Groundwater Levels

The selling agency will collect measurements of groundwater levels in both production and monitoring wells. This will include measurements prior to transfer-related pumping to establish background trends. The seller will measure groundwater levels no less than monthly, during and after the transfer. Post-transfer monitoring will continue until groundwater levels recover to pre-pumping levels or groundwater levels recover to seasonal highs in the spring of the year following the transfer.

The sellers will submit a proposed schedule of readings to the Project Agencies. In some cases, such as transfer-related pumping near Indian Trust Assets, groundwater levels may need to be measured more often than monthly.

Groundwater Quality

Municipal sellers must meet stringent water quality requirements regulated by the California Department of Public Health under the California Code of Regulations, Title 22. The comprehensive water quality testing requirements of Title 22 should be sufficient for the water transfer monitoring program.

Agricultural sellers shall measure specific conductance (electrical conductivity measured at a specific temperature) in samples from each participating production well. Samples shall be collected when the seller first initiates pumping, monthly during the transfer period, and at the termination of transfer pumping. The sellers shall record water quality meter calibration information, water quality measurements, and other site-specific information relevant to water quality on the field log provided by DWR.

Land Subsidence

The extent of required land subsidence monitoring will depend on the expected susceptibility of the area to land subsidence. Areas with documented land subsidence will require more extensive monitoring than other areas. The Project Agencies will work with the seller to develop the specifics of a mutually agreed upon subsidence monitoring effort. Monitoring could range from periodic determination of elevation in strategic locations throughout the transfer area to installing and monitoring extensometers.

Coordination with Other Monitoring Efforts

The monitoring program will include a plan to coordinate the collection and organization of monitoring data, and communication with the well operators and other decision makers. The monitoring plan will identify a contact person responsible for the monitoring and assembly of data. This contact person should be available to meet with a Review Team representative before the start of the groundwater pumping. Together, these parties may visit the monitoring wells at least one month prior to the start of pumping to measure pre-pumping groundwater levels and to read and inspect flow meters. Those implementing monitoring should coordinate their efforts with other local monitoring programs.

Evaluation and Reporting

The proposed monitoring program will describe the method of reporting monitoring data. At a minimum, sellers will provide data summary tables to the Project Agencies, both during and after program pumping.

Post-program reporting will continue until water levels recover to pre-pumping levels or water levels recover to seasonal highs in the spring of the year following the transfer. Sellers will provide a final summary report to the Project Agencies evaluating the effects of the water transfer program, identifying program-related impacts to groundwater and surface water (both during and after pumping), and the extent and significance, if any, of impacts to local groundwater users. The final report should include water level contour maps for the sub-basin in which the acquisition area is located, showing initial water levels, water levels at the end of the transfer, and final recovered water levels.

3.6 Mitigation Program

Groundwater pumping to support water transfers is very controversial in many Northern California counties. Groundwater substitution transfer proponents need to mitigate local impacts caused by groundwater substitution transfers. A mitigation plan must be included in the water transfer proposal.

3.6.1 Objectives

The seller must implement an effective mitigation program to verify and correct problems that could arise due to transfer-related groundwater pumping. A number of potential impacts are sufficiently serious that they must be avoided or mitigated for a project to continue. These include:

- Contribution to long-term conditions of overdraft;
- Dewatering or substantially reducing water levels in non-participating wells;
- Measurable contribution to land subsidence;
- Degradation of groundwater quality that substantially impairs beneficial uses or violates water quality standards; and
- Affecting the hydrologic regime of wetlands and/or streams to the extent that ecological integrity is impaired.

The seller will design and implement a monitoring and mitigation plan and will be responsible for mitigating any significant environmental impacts that occur. Mitigation actions could include:

- Curtailment of pumping until natural recharge corrects the issue.

- Lowering of pumping bowls in third party wells affected by transfer pumping.
- Reimbursement for significant increases in pumping costs due to the additional groundwater pumping to support the transfer.
- Other actions as appropriate.

3.6.2 Mitigation Plan Elements

To ensure that mitigation programs will be tailored to local conditions, the mitigation plan must include the following elements:

1. A procedure for the seller to receive reports of purported environmental or third party effects;
2. A procedure for investigating any reported effect;
3. Development of mitigation options, in cooperation with the affected third parties, for legitimate effects; and
4. Assurances that adequate financial resources are available to cover reasonably anticipated mitigation needs.

Sellers will submit a mitigation plan to the Project Agencies at least two months prior to the groundwater substitution transfer.

Reporting requirements are satisfied by reporting for the monitoring program. If an effect is identified, the description of the effect and the sellers' proposed response will be submitted to the Project Agencies and, as required, to local agencies. The submittal will include the following: 1) a description of how a formal claim may be made if an impact is suspected; 2) the process to be undertaken to address the claim including if and what type of mitigation measure is necessary; and 3) how the mitigation should be accomplished.

Mitigation measures will be locally funded, unless an agreement is made otherwise. Selling agencies will provide assurance that adequate financial resources are available to accomplish any required mitigation.

Appendices

A. Potential Water Transfer Effects on the Projects

Apart from the interest of the Project Agencies in promoting responsible water transfers, they have another important interest in transfers as well—one which underlies much of what this Technical memorandum is about. Transfers through the Delta or affecting Delta water supply in the summer and fall have the inherent potential to adversely affect the SWP and the CVP. If water that is transferred by others is not new water to the system, it will necessarily come instead out of Project supply. As described more generally below, that is impermissible “legal injury.”

The Projects together have the shared responsibility for meeting Delta water quality requirements and are junior to all lawful in-basin water use under the watershed protection statutes. Because the Projects export after all in-basin uses have been met, and must operate to meet Delta flow-related standards, transfers that do not provide new water to the system (or insufficient new water) will require the SWP and CVP to release water from storage or curtail diversions to make it up in order to maintain regulatory compliance. This is why the Projects must be assured that the water made available for transfer is new water that would not be in the system but for the transfer activity.

When the Projects contract to convey transferred water through their facilities, or otherwise weigh in on proposed transfers, they must be sure that the water supply to which their Project contractors are legally entitled is not unlawfully diminished by the transfer. If it is diminished, it is effectively an involuntary and uncompensated transfer of someone else’s water and constitutes legal injury.

B. Rice Cropland Idling Program Conservation Measures from the Giant Garter Snake 2009 DWB Biological Opinion.

1. The water agency will ensure that block size of idled parcels will be limited to 320 acres in size with no more than 20 percent of rice fields idled cumulatively (from all sources of fallowing) in each county. The 320-acre blocks will not be located on opposite sides of a canal or other waterway, and will not be immediately adjacent to another fallowed parcel (a checkerboard pattern is the preferred layout);
2. Parcels will not include:
 - a. Lands within 1 mile of the Sacramento National Wildlife Refuge Complex (Sacramento, Delevan, Colusa, Sutter, Butte Sink and Llano Seco Unit), Gray Lodge Wildlife Area, Upper Butte Basin Wildlife Area, Yolo Bypass Wildlife Area, and Gilsizer Slough CE;
 - b. Lands between Refuges that serve as corridors: lands adjacent to Hunters and Logan Creeks between Sacramento NWR and Delevan NWR; the Colusa Basin drainage canal between Delevan and Colusa NWRs; Little Butte Creek between Llano Seco (NWR unit) and Upper Butte Basin WA; and Butte Creek between Upper Butte Basin and Gray Lodge WA;
 - c. Lands adjacent to Butte Creek, Colusa Drainage Canal, Gilsizer Slough, the land side of the Toe Drain along the Sutter Bypass, Willow Slough and Willow Slough Bypass in Yolo County, the North Drainage Canal and East Drainage Canal in the Natomas Basin;
 - d. East of HWY 99 between the Sutter-Sacramento County line and Elverta Road in the Natomas Basin; and
3. The water seller will ensure that a depth of at least 2 feet of water is maintained in the major irrigation and drainage canals (but never more than existing conditions).
4. Mowing along irrigation canals will be minimized and mowers will be elevated to at least 6" above ground level.
5. If canal maintenance is required, it shall be restricted to one side of the canal in any one year.
6. Geographic dispersal of lands will be maximized.
7. Purchasing water from the same field for more than 2 consecutive years or from a field followed by another program in a consecutive year will not occur.
8. The Project Agencies will recommend that sellers replace culverts already planned for repair or replacement with oversized ones to facilitate better wildlife dispersal.
9. The Project Agencies will recommend that sellers replace water control structures with those requiring less maintenance and less frequent replacement.

C. Well Acceptance Criteria

Table C-1. Well Acceptance Criteria

Well Location ¹	Criteria for Acceptance
Between one and two miles away from of a major surface water tributary to the Delta or a delineated wetland	Well(s) may be accepted if: <ul style="list-style-type: none"> ■ Sufficient information is submitted to demonstrate that the well is not connected to the surface water system tributary to the Delta, or ■ The well perforations are deeper than 50 feet from the ground surface and sufficient information demonstrates that the well is not connected to the surface water system tributary to the Delta. ■ They do not pose a risk of adversely affecting groundwater quality.
Within one mile of a major surface water tributary to the Delta or a delineated wetland	Well(s) may be accepted if: <ul style="list-style-type: none"> ■ The uppermost perforation start below 150 feet bgs; or ■ The uppermost perforations start between 100 and 150 feet bgs and the wells has a surface annular seal to at least 20 feet; a total of at least 50 percent fine-grained materials in the interval above 100 feet bgs; and at least one fine-grained layer that exceeds 40 feet in thickness in the interval above 100 feet bgs; or ■ Sufficient information is submitted to demonstrate that the well is not connected to the surface water system tributary to the Delta.
Between one-half and one mile away from a minor surface water tributary to the Delta or a delineated wetland	Well(s) may be accepted if: <ul style="list-style-type: none"> ■ Sufficient information is submitted to demonstrate that the well is not connected to the surface water system tributary to the Delta, or ■ The well perforations are deeper than 50 feet from the ground surface and sufficient information demonstrates that the well is not connected to the surface water system tributary to the Delta. ■ They do not pose a risk of adversely affecting groundwater quality.
Within one-half mile of a minor surface water tributary to the Delta or a delineated wetland	Well(s) may be accepted if: <ul style="list-style-type: none"> ■ The uppermost perforation starts below 150 feet bgs; or ■ The uppermost perforations start between 100 and 150 feet bgs and the wells has a surface annular seal to at least 20 feet; a total of at least 50 percent fine-grained materials in the interval above 100 feet bgs; and at least one fine-grained layer that exceeds 40 feet in thickness in the interval above 100 feet bgs; or ■ Sufficient information is submitted to demonstrate that the well is not connected to the surface water system tributary to the Delta; or ■ Sufficient information is submitted to demonstrate that the surface water feature does not flow during times when the Delta is in balanced conditions.
1 - Map of major and minor surface water features is available at: http://water.ca.gov/drought/transfers/ Major surface water features tributary to the Delta affected by groundwater pumping are: Sacramento River, Feather River, Big Chico Creek, Cottonwood Creek, Stony Creek, Yuba River, including the Yuba Gold Fields, American River and the Cosumnes River. Minor surface water features tributary to the Delta potentially affected by groundwater pumping are: Colusa Basin Drain, Tule/Toe Canal, and Natomas Cross Canal.	

D. CVPIA Checklist for Water Transfers

**CRITERIA CHECKLIST
FOR A COMPLETE
WRITTEN TRANSFER PROPOSALS**

1. Name and Location of Transferor: (If within a district or contracting entity, identify):
2. Name and Location of Transferee (If within a district or contracting entity, identify):
3. Provide a detailed location map of the area(s) proposed to receive the transferred water.
4. If Transferor is individual within a contracting district or agency, provide documentation supporting claim of right to the quantity of Project water being transferred under the contracting district or agency's Project contract.
5. Complete written description of transfer proposal, including the proposed time period and/or term of transfer.
6. Identify Central Valley Project facility/facilities required to facilitate transfer for conveyance, pumping and/or storage.
7. State quantity of water involved with transfer and identify purpose of use for the transferred water.
8. Provide detailed consumptive use analysis to document how the quantity of water available for the proposed water transfers was calculated.
- 9.. Is quantity to be transferred more than 20% of the Transferor's contracting district or agency's Project water supply? Explain and provide applicable supporting documentation.
10. Will this transfer along with other transfers to date cumulatively total more than 20% of the Transferor's contracting district or agency's Project water supply? Explain and provide applicable supporting documentation.
11. Provide data identifying percentage of total contract supply transferred to date from the Transferor's contracting district or agency under whose contract the Project water is being transferred.

12. Identify method by which water is being made available for transfer:

(A) Following:

- (1) All transfer proposals involving fallowing shall be submitted no later than March 1 of each irrigation season or 30 days after the effective date of these Interim Guidelines;
- (2) Acres fallowed as part of normal rotation or crop set aside program will not be considered as making water available for transfer.
- (3) Identify and document crop and total number of acres being fallowed (explain any differences from historical cropping pattern/historical mix).
- (4) Identify and document consumptive use of crop being fallowed.
- (5) Historical cropping data for lands being fallowed (minimum of last 5 years or from 1987 to present).

(B) Requirements for substituting groundwater use for surface supply:

- (1) Comprehensive groundwater basin study or evaluation of groundwater supplies demonstrating that the transfer will have no significant long-term adverse impacts on groundwater conditions, inter-related surface streams, or other groundwater supplies in Project service area; OR

Comprehensive evaluation of the potential impact on groundwater supplies accompanied by an adopted groundwater management plan;
- (2) Location map of groundwater well(s) to be utilized;
- (3) Drillers log for groundwater well(s) to be utilized.
- (4) Provide location of other groundwater wells in Project service area.
- (5) Identify and document area(s) normally irrigated by wells.

(C) Conservation:

- (1) Identify method of conservation
- (2) Transfer proposals involving water made available by conservation measures will be reviewed on a case by case basis.

13. Have requirements of the NEPA, ESA, and FWCA (if applicable) been completed? Explain and provide applicable documentation.
14. Have requirements of the CEQA and CESA been completed? Explain and provide applicable documentation.
15. If transfer is 20% or greater of the Transferor's contacting district or agency's Project water supply, has public participation necessary to complete the transfer been done? Explain and provide supporting documentation.
16. If electric power, other than Project use power, is necessary to transfer Project water, then the Transferor must provide documentation that such electric power has been obtained. The Transferor must also provide documentation that Western Area Power Administration finds that the source of power is available for pumping at the Project facilities.
17. The Transferor must submit a deposit of \$3,000 to cover the administrative costs of reviewing each water transfer proposal. If the transfer proposal is denied, any deposit remaining will be refunded to the Transferor. If the transfer is approved, the transferor will be refunded any deposit remaining or billed for any additional administrative costs incurred in processing the transfer proposal.
18. ~~Attach statement by the Project contractor holding the contract for the water being transferred that the transfer will have no unreasonable impact on water supply, operations, or financial conditions of Project contractor or its water users. Condition sunset September 30, 1999, by §3405(a)(3).~~
19. ~~If the transfer will involve use of Project water outside Project service area, provide proof of public notification for right of first refusal. Condition sunset September 30, 1999, by §3405(a)(3).~~